PROMETHEUS AND THE GODS– AN ESSAY ON ECOLOGY*

IAGO GALDSTON

Director of Training, Department of Mental Health
State of Connecticut

I TAKE it that the myth of Prometheus is essentially an archaic exposition on ecology, and more specifically, on Man's relation to Nature indwelling and about.

Prometheus, in the classical version of Hesiod, was not a man but a demi-god, a descendant of the Titans, those giants whom the Olympians had conquered. His contest was not with Nature but with Zeus, whom he first endeavored to cheat, and from whom he later stole FIRE and gave it as a gift to men.

Yet, though the simpler reading of the classical myth yields merely the tale of a "Crime and its Punishment," it is too suggestive of deeper meaning to be taken for a primitive thriller.

The myth of Prometheus has engaged the interests of many scholars, poets and philosophers, literally down the ages.** Hesiod, the didactic Boeotian poet, believed to have lived in the eighth century B.C., treated of Prometheus in his *Theogony* and in *Works and Days*–the latter a didactic poem full of wise sayings designed for all the days and all the exigencies of peasant life.[2]

The immortal Aeschylus dedicated four of his plays to the exploration of the tragedy of Prometheus. Unfortunately, only one of these, *Prometheus Bound*, has survived. Of the others, *Prometheus Unbound*, *Prometheus The Torchbearer*, and *Prometheus The Fire Kindler*, only fragments are now known. In more recent times, Goethe, Shelley, and Elizabeth Barrett Browning, have each written a poem with Prometheus as the heroic protagonist.

The critical literature on Prometheus, the philanthropic demi-god whose gift of fire brought to man the powers of Vulcan, and Pandora's

* Presented at the Dinner Meeting of the *Twenty-Third Eastern States Health Education Conference,* held at The New York Academy of Medicine, April 25 and 26, 1963.
This contribution is based, in part, on studies conducted with the support of a grant from the National Institutes of Health.

** "Poets and Philosophers of all nations have for centuries loved 'Prometheus Bound' far more than any other Greek drama, and they will always love it, as long as a spark of Prometheus' fire still burns in the human soul."[1]

afflictions, is vast. Though the meaning of the myth is read in several ways it is agreed that the Prometheus tragedy is an *excursus* in "cosmogony, taken in the Greek sense as the founding of the world." [3] Yet it is a cosmogony more particularly in the human sense, in the sense of the relationship of man to the world, and more notably that of the inventive and creative man. "The tragedy of Prometheus is not a purely individual one;" wrote Werner Jaeger (*Paideia*, vol. I, p. 262), "it is the agony of all spiritual pioneers. The hero was created by Aeschylus' imagination. Hesiod knew Prometheus only as the Evil One, who was punished by Zeus for stealing fire from heaven. But Aeschylus, with that mighty imaginative power which we cannot sufficiently admire and honor, built up his act into an imperishable symbol of humanity.

"Prometheus he made the Bringer of Light to suffering mankind. The divine power of fire was for him the concrete image of civilization And Prometheus was the civilizing genius who explores the whole world, who makes it subservient to his will by organizing its forces, who reveals its treasures and establishes on a firm basis the groping, insecure life of man." [4]

The divergence between Hesiod and Aeschylus, in their regard of Prometheus, is to be noted. To repeat—Hesiod saw in him the Evil One, and Aeschylus the Hero, the civilizing one, he who establishes on a firm basis the groping, insecure life of man.

It will, in a large measure, be our task to assess the meaning and significance of this divergence in judgment. Was Prometheus evil, and if so, in what respect? Was he heroic, then why did Zeus curse and punish him? And if Prometheus *did* set man's groping, insecure life on a firm basis, why then Pandora's Box whence issued a host of calamities that spread over the earth with the speed of lightning, so that Death, who had been coming to mortals on slow, reluctant feet, now walked with winged steps?

The intriguing part of the Promethean drama is not Prometheus' love for man; it is nortoriously well known that the Greek gods were not indifferent to the mortals, both male and female; nor is it in that he gave fire to man, for in the lore of the myth there are other fire givers: Hermes who "did not steal it, but discovered it by his own inventiveness, in his own mind so to say," and Hephaistos, who *had* it as a portion of his endownment, to whom "fire was so essential that his name is even used to designate it." [5]

It is rather the punishment which Prometheus suffered for his crime, and the dire involvement therein of the human race through the afflictions issuing from Pandora's Box, that must intrigue us.

In the pursuit of this we need to turn to the other and greater personage in the Prometheus drama, to Zeus the father of gods and men. Though in the Prometheus tragedy Zeus plays the role of tyrant, he was, in effect, the god who gave the sense of justice and the idea of law to all men. Nor was Zeus other than grateful to Prometheus until the time Prometheus attempted to deceive him and later stole fire from heaven, and gave it to man.

Aeschylus, who in *Prometheus Bound* pictures Zeus as hard of heart, merciless, unforgiving, in *The Persians. The Suppliants*, and *Oresteia*, represents Zeus as the majestic god, wise, responsive to man and full of eternal counsel.

Zeus' wrath, the punishment he inflicts upon Prometheus, must therefore have derived from the gravity of the crime rather than the affront offered by the lesser to the greater. The gravity of the crime clearly lay in its *immanent consequences*, in Pandora's Box, whence issued misery in countless forms, filling the earth, the air, and the sea. By day and by night, it is told, sickness prowled among men, secretly and silently. . . . A flock of fevers beleaguered the earth, and it was said "Death who had been coming to mortals on slow, reluctant feet, now walked with winged steps." [6]

Yet, what in effect *was* the innate gravity of the crime, was that which was interlarded between the *deliquent* act and its *consequence*. It was that, in stealing fire from the heavens and making a gift of it to man, Prometheus had broken into the "accord set up by Zeus," had set loose a spreading menace, threatening the harmonious order of the eternal cosmos. In the language of this day, Prometheus, the philanthropist, the crafty and inventive genius, the wilful one, and the brave one too, who freely avows

> "Of my own will I shot the arrow that fell short,
> of my own will.
> Nothing to deny.
> I helped men and found trouble for myself.
> I knew, and yet not all." [7]

This Prometheus, named the "foreseeing," foresaw inadequately, and was thus the "mythic first" to upset the ecology of man and the world.

Since then the afflictions of Pandora's Box have indeed been visited upon men—and the earth.

Aeschylus was a poet-dramatist, not a scientist. He neither thought nor wrote in terms of ecology. But he was steeped in the wisdom of cosmic harmony. "He did not conceive that the Titan's sin was merely an offense against the property of the gods, consisting in the theft of their fire, but rather (in accordance with the spiritual and symbolic significance which he imparted to it) that it was connected with some deep tragic imperfection in the benefit he had done to mankind by his wonderful gift." [8]

This tragic imperfection lay in Prometheus' failure to grasp what Anaximander the Ionian philosopher had so clearly affirmed, to wit, that the ecological concordance may not be tampered with save at the cost of "penalty and compensation." "Things," Anaximander stated, "must pay one another the penalty and compensation for their injustices according to the ordinance of time." The phrasing is a bit cryptic, but the meaning is clear, it is that "the accord set up by Zeus" may not be tampered with without grave peril and dire consequences. Anaximander held that this eternal process of compensation is at work not only in human life but in the whole world. Nature, too, with its forces and oppositions is subject to an immanent rule of law like mankind, and it is this rule of law which regulates coming-to-be and passing-away throughout creation.[9]

But, be it noted, though the law is immanent, it is not immune to human influence. Indeed, in Greek mythologizing as in Greek religion, the universe and man were not assumed to be the passive objects of divine volition and design, as in Christianity. On the contrary, man was credited with a share in the shaping of his own and the world's destiny. "The environing limit, the divine world itself, the heavens, otherwise so inflexible, proved in this respect to be strangely influenced by the human mode of existence." [10]

Clearly then, the concept, if not the term, of ecology was common in Greek thought, and the myth of Prometheus magnificently propounds the tragic complex of *homo sapiens* and *homo faber* of MAN who lives both within and without the "accord set up by Zeus." For man is a manipulator of the universe, more so now than ever before, and his unresolved problem, now as in the mythic days of Prometheus, is how he might alter the world about him to suit his needs and wishes,

thereby inescapably altering the ecology, and yet not suffer such dire penalties and retributive compensations as will undo both him and his world.

The Greeks understood the meaning of ecology and they understood its dynamics. So too did the medieval thinkers. They viewed man as the lesser image of the greater universe, the Microcosm of the Macrocosm. But with the advent of modern science, this insight into the interrelationship of man with the rest of the world, both living and inanimate, was obscured. Science dazzled man's vision, and the tragedy of Prometheus was compounded a "thousand thousandfold."

Now man spoke not of the "accord set up by Zeus," or of its equivalent, but of "mastering nature." "Men no longer studied macrocosm and microcosm as such," wrote Charles Singer in *From Magic to Science*, "but they became physicists or physiologists, taking each of them a separated portion of the universe for special study."[11]

The high priest of this new devotion was Francis Bacon. His *Novum Organum* most clearly expounds the spirit of the new and dawning age of modern science. Therein he propounded his theory of science as the means to discovery and invention. But his was not an idle curiosity, nor a vain pursuit. Bacon was a very practical man and thinker. A science that is not practically useful was, in Bacon's eyes, worth nothing. By means of science, Bacon argued, it would be possible to establish the "dominion of man," the *regnum hominis*, over all things, so that the wants of man's life might be satisfied, his pleasure multiplied, and his power increased. The dominion of man over things, Bacon urged, is the highest and indeed the sole end of science.[12]

No thought here, then, of ecology, no vision of the tribute things must pay to things, nor the awareness of the penalties to be paid according to the ordinance of time when injustices are inflicted.

Bacon is one of the more famous names associated with the dawn of modern science, but Bacon was not one of the founders of science. He was one of its early philosophers and advocates. "Bacon comprehended the altered physiognomy of his age; he sought for the ultimate causes of the change, and wished to make philosophy accord with it. For the new life and its impulses he wished to find a new corresponding logic." [13] He did, and it turned out to be the logic of man's dominance over all things.

Bacon's "methodologies" never gained wide credence or acceptance.

William Harvey made sport of them, saying that Bacon wrote of science like a Lord Chancellor. But the logic of the "new life," that of the dominance of man over all things, was congenial to the mood of the new world, and was not challenged until our own times.

It were well to make certain that what we refer to as "the mood of the new world," tracing it to the advent of modern science, is clearly understood. Two items we need to appreciate. Man was from his very beginning a manipulator of his environment in ways and in degrees so much greater than those of any other living creatures, that he was in that very competence set apart from all the rest. But he did not avowedly, nor by intention, manipulate the environment in order to become "the master of all things." He lived *within* Nature and not, so to say, outside it. Man was also a creature uniquely curious about everything. In that sense, since he was not merely curious but sought also to understand, he was a scientist from the very start. Indeed, during the million or so years since his emergence and up to the advent of modern science, man had acquired a great deal of scientific, technological, philosophical, and psychological lore. The distinctive feature of that scientific lore was that, in the main, it served to explain, to make understandable, to give an account of the world about, and of one's experience in it. The older science was not experimental, but rather observational and descriptive. It was also conjectural, or as we say today, deductive. For the older generations of man, the world itself was the laboratory, and existence the experiment. All this implied a basic acceptance of the world, and also of Nature, as that given whole within which all efforts to "better things" must perforce be confined. To paraphrase and sum up, the underlying conviction was that the world could be bettered, but not changed.

In the early part of the last millenium this heretofore solid faith was breached by a beginning doubt. Precisely "*when*" is hard to say, and the reasons "*why*" even more so. Since history is commonly anchored to personages, we might cite the name of Roger Bacon, Franciscan monk, born about the year 1210. Roger was greatly ahead of his time, in that he was an advocate of the experimental method. He himself conducted some research in a number of problems, with, however, meager results. He "foresaw" many mechanical inventions, such as machine-driven ships, carriages, and flying boats. He toyed with a host of items such as burning glasses, gun powder, the magnet, Greek

fire, and artificial gold. Roger Bacon is, in a sense, an anomaly, rather than an innovator. His impact upon his contemporaries was negligible. But he did foreshadow the coming age of scientific inquiry, the age we call the Renaissance.

The effective heralds of that age were Copernicus (1473-1543), Telesio (1508-1588) and Giordano Bruno (1548-1600). These were the initiators of the persuasion that differed so radically from the one held by the ancients, namely that the world did move in the "accord set up by Zeus." The world of nature, these innovators maintained, is not an organism guided by an intelligence. The natural world, they argued, is a machine: a machine in the literal and proper sense of the word. "The Renaissance thinkers," wrote R. E. Collingwood, in his book *The Idea of Nature* (Oxford 1945, p. 5) "like the Greeks, saw in the orderliness of the natural world an expression of intelligence: but for the Greeks this intelligence was nature's own intelligence, for the Renaissance thinkers it was the intelligence of something other than nature: the divine creator and ruler of nature." [14]

Historically it was but a brief step from this to the dismissal of the celestial pilot, an action tersely expressed in the remark of Laplace: "*Je n'avais pas besoin de cette hypothèse-là.*" This was in response to Napoleon's observation that Laplace had written a large book on the system of the universe, without ever mentioning its Creator. Whoever was its creator, Man, it was held, could be the master of the universe.

In sketching the intellectual formulations that signal man's rejection of the "accord set up by Zeus," the abandonment of the concepts of Macrocosm and Microcosm, and the emergence of man's avowed intentions to become master over all things, we are a bit ahead of the real timing of events. For here, as in so many segments of experience, the act came before the thought.

Man had manipulated his environment since his earliest days, and fire was one of the earliest means he employed. Professor Raymond Dart of the University of Witwatersrand, South Africa, has postulated that man's forerunner, the hominid *Australopithecus Prometheus*—note the name—a peculiar primate intermediate between ape and man, kept fire in his caves. Such fire was not made, but was gotten from fires resulting from lightning or spontaneous combustion. Man, it is estimated, has used fire as a powerful tool capable of tremendous influence on his environment for at least a quarter million years. [15] However,

according to Linton, the earliest known group able to make fire were the cave men of Europe some thirty thousand years ago. Was this then the time of Prometheus?

Fire served man in numerous ways. He set fire to jungles and thick woods to open them up so that hunting would be better and safer. He set fires to rouse and drive game, to improve pasture, to improve berry crops, to make vegetable foods more available. Man has also used fire as a means of war. "The first men to see the values of flame to rouse or drive game would certainly have realized that the same tool could be helpful to flush an enemy from dry brush or grass,"[16] or to scorch the earth and block an enemy.

All these uses of fire were beneficial to man, but the most important thing about fire was that it enormously increased man's food supply. It greatly extended the kinds of vegetable foods he could eat and digest. Meats can be eaten uncooked, and so can some wild fruits, nuts and berries. But most root vegetables, tubers, and grains, the staples of the vegetable crop, cannot be consumed raw. As Linton phrased it, "Bread is man's staff of life but there can be no bread without fire." [17]

Fire and increased food yielded a marked increase in population, man's early boon and threatening bane. Of this more later.

Though early man burned extensive areas, over and over again, it is maintained that his activities had little if any effect on the geographic environment. Nor was the potential fertility of the soil, or, in general, man's ecology, radically changed during the period of classical antiquity, i.e. from 1100 B.C. to the 6th century A.D. (565 A.D.) What did change radically was man's social patterns, his intellectual and political orientations, and his technological competences, the latter having grown immensely.

One of the most radical ecological changes effected during the early part of the present millenium derived from technological improvements in agriculture. This, in turn, was related to a marked increase in population. The two, agriculture, or more strictly speaking, food production, and population are interdependent. An increase in food production favors an increase in population. The latter then becomes a pressure source for greater food production, and the continuing inter-reaction causes a spiraling of both.

At the beginning of the Christian era, the population of the Roman Empire, including slaves, totaled approximately 55 million, of which

number 23 million inhabited Europe, and the rest, Africa (14.5 million) and Asia (17.5 million). Six hundred years later, because of the disintegration of the Roman Empire, the ensuing wars, famines and plagues, Europe's population had declined to below 20 million. Conditions were even worse during the next 400 years. But at some point during this dismal period a reaction set in in the form of "agrarian colonization." Men began to extend the arable lands. "For," as Bennett wrote, "to a family burdened with more children than their shares in the common fields would warrant . . . assart* land (that is, land free to be cleared and used), was a godsend. Here they could utilise their spare labour, and produce something to help fill the many hungry mouths at home." [18]

Clearing the land meant cutting down trees and grubbing up roots —arduous and back-breaking labor. Yet it was done, consistently and effectively. The arable land was greatly extended, and Europe largely deforested.

In the time of Charlemagne (742–814 A.D.) forests spread their cloak over a great part of the soil of the West. Ireland, Wales, Cornwall, and the Scottish Highlands, which are today bare, were then covered with vast oak, birch, fir, and pine woods. A third of Flanders and the Netherlands, now so bare, were, before the eleventh century, for a great part forest regions, joining on to the immense forests of the Ardennes and the Eifel. Germany and France were heavily forested. "From Argonne to the Alps and the Pyrenees, from the ocean to the Juras, all was forest, interspersed with open plains which had been brought under cultivation."[19] Within these forests there were quantities of bears, boars, deer and stags, bisons, aurochs and beavers.

Forests and animals were ruthlessly sacrificed to gain more arable land to feed more hungry humans. Beginning about the year 1000, there began a period of land reclamation which was to continue, intensively, to the end of the 12th century, and with an abated intensity up to our own days. "At no period," wrote Boissonnade, "has the conquest of agricultural land been carried on with so much discipline and ardour." [20] Thousands of pioneers came to prepare the way for the work of plough and hoe by burning away brushwood, thickets, and parasitic vegetation, clearing forests with the axe, and uprooting trunks with the pick. As a result the face of Europe changed. "Germany in

* The term assart is derived from the French *essarter* "to grub up" or "to clear."

particular was transformed. In its immense forests, through some of which an eleventh-century missionary could ride for five days on end in complete solitude, pioneers made clearings, . . . established great farms all along the side of the roads or on the edge of the woods."[21] In England the woods were attacked with such vigour that nothing was left of the ancient forest which once covered the soil of Britain, save a few rare remnants. In the Low Countries, France, Spain and Italy, the forest fell before the axe of the pioneer, and with this a pitiless war was waged against wild beasts.

The plow followed in the wake of axe and pick. "Side by side with the labor of hoe and spade, the use of the iron ploughshare allowed the earth to be plowed deeply, sometimes seven or eight times on end." [22] Improved ploughing and manuring of the land, the superior cultivation of cereals, and of vegetables, yielded better harvests and a larger food resource for both animals and humans, and in consequence by the end of the 13th century the population of the six states of the West contained together perhaps 60,000,000 souls, twice as many as they had numbered before the fifth century.[23]

We are at this time at the end of the 13th and the beginning of the 14th century—48 years before the Black Death, that most famous of epidemics which from 1348-1350 ravaged all the European countries and, it is estimated, cost from 24 to 25 million human lives.

It was the most devastating of the epidemics in the Middle Ages, but it was, in effect, only one among many. Pandora's afflictions were upon man and Death now walked with winged steps. Famine was endemic, sometimes in one region and sometimes in another.[24] In France, between 970 and 1100, there were no fewer than sixty famine years. England suffered terrible dearths in 1086 and 1125. The whole of Europe experienced in turn this frightful scourge, which decimated the population of entire districts. Hunger, and bad hygiene, multiplied epidemics of plague and leprosy.

Charles Creighton in his *History of Epidemics in Britain* wrote: "The history of English epidemics, previous to the Black Death is almost wholly a history of famine-sicknesses; and the list of such famines with attendant sickness, without mentioning the years of mere scarcity, is a considerable one."[25] Conditions in Britain well typified those throughout Europe. But on the score of scarcity and famine we need recognize that they are a result no less of the more numerous

mouths to be fed than of the lesser quantities of food available. The dynamics of this equation we witness in our own time among the so-called underdeveloped countries where the survival rate of infants born results in a population increment exceeding the countries' capacities in food production.

To the plague of periodic famine there was added another ecological blight, that of crowding, and there issued from Pandora's Box those afflictions so aptly named and described by Major Greenwood as the "Crowd Diseases."

The crowd diseases were rooted in the cities, and spread therefrom to the surrounding countryside, waning only as they broached on the sylvan perimeters. The crowd diseases were not unknown in antiquity. The plague of Athens broke out in 435 B.C., and was ascribed to the crowding of the Athenians in the capital city in their efforts to avoid the ravages of the Lacedaemonians. Thucydides attributed the plague to the practice of the inhabitants of living in crowded quarters, where there was hardly room to breathe, so that when the epidemic broke out there was much to favor its development. Other capital cities, including Rome, Alexandria, and Constantinople, were periodically afflicted in ancient times.

But the crowding and the crowd diseases we encounter in the mid-centuries of the second millenium A.D., are of an order quite different from those of antiquity. They do not, so to say, "break out and then burn out," but tend rather to burn and smoulder continuously, and over many decades. The crowding was not due to emergencies but was the result of the new commercial and industrial developments that had their origins in the 13th century, and which drew so much of "the surplus population" into the reanimated and burgeoning medieval cities.

Its victims were of that new social class, neither serf nor true freeman, that later came to be known as the industrial proletariat. Henri Pirenne, the distinguished Belgian historian, describes these developments as follows: "The increase of the population naturally favored industrial concentration. Numbers of the poor poured into the towns . . . where trade grew proportionately with the development of commerce, [and] guaranteed them their daily bread. Their condition there, however, seems to have been very miserable. The competition which they maintained with each other in the labor market allowed the mer-

chants to pay them a very low wage. Existing information, of which the earliest dates back to the 11th century, shows them (the new poor city dwellers) to have been a brutish lower class, uneducated and discontented. The social conflicts which industrial life must have fomented . . . were already in embryo in the very period of city evolution." [26]

It is tempting to follow further the history of the development of the mercantile middle class, of the capitalist class and of the proletariat. And it would not be entirely amiss if we did so. For this segment of historical experience tells of another phase of the ecological revolution, one effected in the social realm. During this period kings and princes, knights and manorial barons, churchmen of all ranks, were confronted with the new and emergent classes, the bourgeoisie and the proletariat. A contest for power, privilege and prerogative ensued. It continued for several centuries, and was devastatingly costly in human lives and in property. It can be said that in some measure, and in certain respects, the contest remains unresolved to this very day.

But despite its interest and significance, we may not follow this line of inquiry and exposition. Time will not allow it; besides, it is very well told and documented by many competent historians. Instead, and at this point, a brief resumé may be in order. We took note of the intellectual reorientation effected in the sixteenth century, which argued for man's mastery of Nature, and thereby of the world, and which sketched the ways by which man might gain the power and means to attain these goals.

We noted, too, the antecedent agricultural revolution, the deforestation of the lands and the extension of arable fields, which collectively resulted in a marked increase in food and population. This sequence of an initial improvement in agriculture, to nurture an increased and healthy population, as a prerequisite to technological progress, and the accumulation of capital, so essential to the development of an industrial machine economy, has been clearly expounded by Professor Rostow of the Massachusetts Institute of Technology. It is supported by historic experience. In our own exposition we sketch a collateral sequence. Man acquired fire, and with it he both increased and improved his foods. More and more of his kind populated the earth. Man learned how to use fire to smelt metals. Out of metals he made superior tools and powerful machines. With machines, and fire, he harnessed steam. And through them he generated electricity. By means of electricity he loosed

the captive energy of the atom.

If we accept Linton's estimate, man achieved all this in the span of some thirty thousand years. But most of the great technological achievements were attained during the past five to six hundred years.

It was during this latter period that man seemingly grew utterly insensible to the meaning and interplay of ecology. Man became the wastrel of the earth. Beast, bird, fish, water, air, the woods, soil, and even his own kind became expendable, without account, without remorse, without concern, and all in the pursuit of man's mastery over nature, and the earth. True, his was seldom a calculated villainy, or even a deliberate performance. It was a byproduct of intentions and purposes that either innately were, or were rationalized as being, good, laudable, and progressive. No one planned and deliberately created those slum areas that were the festering sores of the industrial cities of Europe and America. But they did come into being and some remain to this very day. No one but "conditions" compelled men, women and children to work long hours, under taxing and unhygienic circumstances. But they did, and the effects of these experiences, these ecological disruptions, also remain perceptible to this very day.

It may seem odd to picture man as an ecological unit, or of the relation of man to man as an ecological dynamic. But that is so only because we are accustomed to think of man as the pinnacle of creation, and all the rest as his "*to do with*," a conceit initially propounded in the Book of Genesis (Chap. 1, 26). But only to himself is man the pinnacle of creation. Nature knew and seemingly "cared" for other creatures long before man emerged on earth, and Nature is likely, precisely because of man's conceit, to continue to care for other creatures long after man has disappeared from the face of the earth, unless, of course, the earth itself together with man, has been reduced to primal matter and energy, in some atomic holocaust.

I hasten to add that though this is a lugubrious thought and an utterly dismal prospect, it need not, and should not be taken as earnest prophecy. For in all this exposition we have been concerned with Western man, and more particularly with Europe. We have followed *his* history, *his* developments. But then, it should be asked, what of the vast East, and even more promising, of great Africa? They have not yet been, and may never be, corrupted by the ambitions and conceits of Western technological culture. There are peoples on earth

who eschew killing animals, and who, when their plough scores the earth, pray for forgiveness. These people are *not* insensible to the meaning of ecology.

This too is an excursus I may not pursue further. Let me return then to the main thread of my theme. Man has wantonly depleted the earth and all that lives on it, to serve his purposes and his conceits. He has thereby disturbed the ecology (the better term is the ecosystem), to the detriment of all this system embraces, including man himself. Man has upset "the accord set up by Zeus" and has, like Prometheus, suffered the wrath of Zeus. Until, like Prometheus of later versions, he is redeemed, man will continue to suffer, until he too redeems himself. How? Whence may come his redemption? I believe I could do no better than to quote in answer from Paul B. Sears' exposition titled *The Processes of Environmental Change by Man:* "Change in the ecosystem of which man is part is inevitable, since this system is a process, and he is inevitably affected by such changes. On the whole, those changes which are natural (i.e., not due to his interference) take place on a scale and at a rate which is not disastrous to him. While some of his activities may regulate and utilize these changes to his benefit, more of them serve to accelerate the rate and widen the scope of natural changes in ways that lower the potential of the environment to sustain him. For such effects man is responsible, and where responsibility enters so do ethical problems.

"Through science, man now has the means to be aware of change and its effects and the ways in which his cultural values and behavior should be modified to insure their own preservation. Whether we consider ethics to be enlightened self-interest, the greatest good for the greatest number, ultimate good rather than present benefit, or Schweitzer's reverence for life, man's obligation toward environment is equally clear." [27]

Clear also is this, that we begin with science and end with ethics. Ecology essentially is a discipline in science, but it is, as Sauer affirms, also freighted with moral issues and mortal consequences.

And, need we underscore the timeliness of this consideration? Most probably, yes! For in the ordinary we are too dazzled by the technological achievements in present-day life to see the other elements in the setting—much psychological suffering and illness, increasing technological unemployment, a mounting horde of gerons doomed to dry

rot, a pervasive mood of dependency, a feverish quest for security, the loss of meaning in life, work and possessions, and, above all else, the dread of thermonuclear war. The crowd diseases, those that dominated man's thoughts for long, tuberculosis, typhoid, typhus, cholera, in a word, the infectious diseases, have been mastered. Now we become aware of the emotional, psychological, social, economic and cultural ills affecting our Society. These ills are no less to be ascribed to distortion of the ecosystem than are the infectious epidemic diseases and the disorders of mass-malnutrition. In all this it is most distressing to perceive that those who *are* concerned, and those who either are charged with the responsibility, as is government, or voluntarily, as do the schools and universities, take upon themselves the responsibility to seek for correctives and remedies, pay little or no attention to ecology, and seemingly have no sense of the ecosystem and its interactions.

Most lacking in these respects appear to be certain groups of economists and sociologists intensely animated with a zeal to manipulate the world about. The former, that is, the economists, are zealous to help history attain its destined ends (a Marxist formulation); the sociologists, to correct the patent evils in contemporary social and economic existence. With the best of intentions both groups pressure the ecosystem—in the direction of their persuasions, and quite frequently succeed in changing its contours and dynamics. Yet, in so far as they are, and remain, unmindful of the collateral untoward effects of their manipulations they practice scientific quackery, too protean and too subtle to be detailed here, but a high order of quackery nevertheless.

As a *caveat* I must here affirm that only the dull of wit will construe these last observations as a plea for a return to the "Good Old Days" or as a defense of the *status quo*. Nor have I the intention to denigrate economists and sociologists. Several of my most enlightened friends are protagonists of these disciplines.

If mankind is to survive, and I believe it will, even if its Western segment obliterates itself, it will need to learn in time to understand the initial wrath of Zeus. It will then perceive in the punishment of Prometheus not Olympian retribution, but a warning. It will recall that Pandora's Box, emptied of its afflictions, still contains hope. It will grasp that *homo sapiens* and *homo faber* are dear to Zeus, if they but function within the accord set up by Zeus. Man will then understand what Anaximander meant in the warning: "Things must pay one another the

penalty and compensation for their injustices according to the ordinance of time."[28]

Pandora's Box still harbors hope, and we must hope to share in it. Otherwise there is the spectre of Prometheus' doom, so majestically pictured by Aeschylus:

> "Lo, in grim earnest the world
> Is shaken, the roar of thunders
> Reverberates, gleams the red levin
> And whirlwinds lick up the dust.
> All the blasts of the winds leap out
> And meet in tumultuous conflict,
> Confounding the sea and the heavens."[29]

How very reminiscent are these lines of the mushroom cloud that rose one fateful day to darken the horizons of the morrow.

REFERENCES

1. Jaeger, W. *Paideia,* Vol. I. New York, Oxford Univ. Press, 1945, p. 263.
2. Schwab, G. *Gods and Heroes,* New York, Pantheon Books, Inc., 1946, p. 18.
3. Kerenyi, C. *Prometheus,* New York, Pantheon Books, Inc., 1959, p. 83.
4. Jaeger, W. *Op. cit.,* p. 262.
5. Kerenyi, C. *Op. cit.,* p. 77.
6. Schwab, G. *Op. cit.,* p. 34.
7. Aeschylus, *Prometheus Bound,* in *The Complete Greek Drama,* vol. I. W. J. Oates and E. O'Neill, Jr., eds. New York, Random House, 1938.
8. Jaeger, W. *Op. cit.,* p. 264.
9. *Ibid.,* p. 160.
10. Kerenyi, C. *Op. cit.,* p. 30.
11. Singer, Ch. *From Magic to Science,* New York, Boni and Liveright, 1928, p. 110.
12. Fischer, K. *Francis Bacon of Verulam,* London, Longmans and Roberts, 1857.
13. *Ibid.,* p. 45.
14. Collingwood, R. E. *The Idea of Nature,* Oxford, The Clarendon Press, 1945, p. 5.
15. Stewart, O. C. *Fire as the First Great Force Employed by Man,* in *Man's Role in Changing the Face of the Earth,* W. L. Thomas, Jr., ed. Chicago, Ill., Chicago Univ. Press, 1956, p. 117.
16. *Ibid.,* p. 120.
17. Linton, R. and A. *Man's Way from Cave to Skyscraper,* New York, Harper and Brothers, 1947, p. 26.
18. Darby, H. C. *The Clearing of the Woodland in Europe,* in *Man's Role in Changing the Face of the Earth,* W. L. Thomas, Jr., ed. Chicago, Ill., Chicago Univ. Press, 1956, p. 191.
19. Boissonnade, P. *Life and Work in Medieval Europe,* London, Routledge and Kegan Paul, Ltd., 1927, pp. 72-73.
20. *Ibid.,* p. 229.
21. *Ibid.,* p. 229.
22. *Ibid.,* p. 230.
23. *Ibid.,* pp. 237-38.
24. Curschman, F. *Hungersnöte im Mittelalter,* Leipzig, 1900.
25. Creighton, Ch. *History of Epidemics in Britain,* Cambridge University Press, Vol. 1, 1891, p. 15.
26. Pirenne, H. *Medieval Cities,* New York, Doubleday Anchor Books, 1925, p. 110.
27. Sears, P. B. *The Process of Environmental Change by Man,* in *Man's Role in Changing the Face of the Earth,* W. L. Thomas, Jr., ed. Chicago, Ill., Chicago Univ. Press, 1956, p. 481.
28. Jaeger, W., *Op. cit.,* p. 159.
29. Aeschylus, *Op. cit.*